Amendments to the Claims

Please amend the claims as follows:

1. (Original) In a distillation system, a distillation pot, comprising:

walls, including a heated wall, and a cover that collectively define an interior space in which a liquid is contained as the liquid is being heated in the pot for a distillation purpose, the walls and cover having respective inside surfaces;

a plate configured and situated in the interior space so as to divide the space into an upper portion and a lower portion that hydraulically communicate with each other by an upper fluid passageway and a lower fluid passageway defined by the plate; and

a thermally conductive member extending from a location on an inside surface of a wall into the liquid and configured so as to be contacted by the liquid whenever the pot contains liquid being heated for distillation and to serve as a direct thermal connection from the liquid to a corresponding location outside the wall, adjacent the location on the inside surface, at which the temperature of the liquid in the pot can be sensed,

wherein the thermally conductive member extends into the lower fluid passageway so as to contact and be at the temperature of the liquid passing through the lower fluid passageway, and, as the liquid is being heated in the pot, the liquid circulates from the lower portion through the upper fluid passageway to the upper portion, and from the upper portion through the lower fluid passageway past the thermally conductive member to the lower portion.

2. (Original) The distillation pot of claim 1, wherein:

the heated wall is located in the lower portion;

the thermally conductive member extends into the lower portion; and

as the liquid is heated in the lower portion, the liquid contacts the thermally conductive member.

3. (Original) The distillation pot of claim 1, wherein the upper fluid passageway defines a reflux vent extending from the lower portion and that opens into the upper portion, in which bubbles passing through the upper fluid passageway from the lower portion break in the

upper portion to release entrained liquid that drains into the lower portion through the lower fluid passageway.

4. (Original) The distillation pot of claim 1, wherein:

the heated wall is located in the lower portion; and

bubbles formed in the liquid in the lower portion are guided by the plate to the reflux vent and travel up the reflux vent to the upper portion where the bubbles release entrained liquid for circulation through the lower fluid passageway and past the thermally conductive member to the lower portion.

5. (Original) The distillation pot of claim 4, wherein the bubbles are propelled from the reflux vent against the inside surface of the cover, thereby releasing the entrained liquid.

6. (Original) In a distillation system, a distillation pot, comprising:

walls, including a heated wall, and a cover that collectively define an interior space in which a liquid is contained as the liquid is being heated in the pot for a distillation purpose, the walls and cover having respective inside surfaces;

a reflux plate configured and situated in the interior space so as to have a vertical portion and a sloped portion including a lower end and a higher end, the sloped portion having peripheral edges between the higher and lower ends; and

a thermally conductive member extending from a location on an inside surface of a wall into the liquid and configured so as to be contacted by the liquid whenever the pot contains liquid being heated for distillation and to serve as a direct thermal connection from the liquid to a corresponding location outside the wall, adjacent the location on the inside surface, at which the temperature of the liquid in the pot can be sensed, wherein

the peripheral edges of the sloped portion are sealingly attached to respective inside surfaces of the walls so as to divide the interior space into an upper portion and a lower portion that communicate with each other via the higher end and the lower end;

the heated wall is located in the lower portion;

the vertical portion extends upward from the higher end relative to a respective inside surface of a wall so as to define a reflux vent between the vertical portion and the respective

inside surface, the reflux vent opening in the interior space beneath the cover to provide said communication from the lower portion to the upper portion; and

the lower end extends, with an intervening clearance, around the thermally conductive member, the clearance being sufficient to provide said communication from the upper portion to the lower portion such that, as the liquid is being heated in the pot, bubbles formed in the liquid in the lower portion are guided by the sloped portion to the reflux vent, rise up the reflux vent, and are propelled from the reflux vent against the inside surface of the cover, thereby releasing entrained liquid for passage through the clearance to below the reflux plate.

7. (Original) The distillation pot of claim 6, further comprising a heater in thermal contact with the heated wall.

8. (Original) The distillation pot of claim 7, wherein the heated wall is a bottom wall of the pot.

9. (Original) The distillation pot of claim 7, further comprising a thermostatic switch in thermal contact with the corresponding location outside the wall.

10. (Original) The distillation pot of claim 6, further comprising a thermal sensor in thermal contact with the corresponding location outside the wall.

11. (Original) The distillation pot of claim 10, wherein the thermal sensor is a thermostatic switch.

12. (Original) The distillation pot of claim 6, wherein the inside surface of the heated wall defines at least one vane situated and configured to provide thermal transfer from the heated wall to the liquid in the lower portion.

13. (Currently amended) The distillation pot of claim 6, wherein the clearance is situated and configured such that ~~that~~, as the liquid flows through the clearance from the upper

portion to the lower portion, the liquid flows past the thermally conductive member while contacting the thermally conductive member.

14. (Original) The distillation pot of claim 6, wherein the thermally conductive member has a fin-like configuration extending toward a center of the pot.

15. (Original) The distillation pot of claim 14, wherein the thermally conductive member has a ratio of surface area to volume of at least 20.

16. (Original) The distillation pot of claim 6, wherein:

the heated wall is a bottom wall of the pot; and

the inside surface of the heated wall defines at least one vane situated and configured to increase thermal transfer from the heated wall to the liquid in the pot during heating of the liquid in the lower portion.

17. (Original) The distillation pot of claim 6, wherein the lower portion includes a bottom surface that defines a drain port that slopes toward a drain port defined in a wall of the lower portion.

18. (Original) The distillation pot of claim 6, having a substantially cylindrical shape as defined by the walls that include a bottom wall and side walls.

19. (Original) The distillation pot of claim 18, wherein:

the bottom wall is the heated wall; and

the reflux vent extends upward in the pot, adjacent the side wall.

20. (Original) The distillation pot of claim 6, defining a vapor outlet situated on an opposite side of the pot from the reflux vent.

21. (Original) The distillation pot of claim 20, wherein the vapor outlet is defined in the cover.

22. (Original) The distillation pot of claim 6, further comprising a control valve hydraulically connected to a supply of liquid for distillation in the pot, the control valve comprising a level-sensing mechanism that is responsive to a liquid level in the pot so as to add liquid from the supply to the pot for distillation whenever the liquid in the pot is below a pre-determined level.

23. (Original) The distillation pot of claim 22, wherein:
the level-sensing mechanism is a float assembly; and
the float assembly is situated in the upper portion.

24. (Original) In a distillation system, a distillation pot, comprising:

wall means, including heated wall means, and cover means that collectively define an enclosed interior space in which a liquid is contained as the liquid is being heated in the pot for a distillation purpose, the wall means and cover means having respective inside surfaces;

interior-space-dividing means for dividing the interior space into an upper portion and a lower portion that hydraulically communicate with each other by an upper fluid-passageway means and a lower fluid-passageway means; and

thermal-conduction means extending from a location on an inside surface of a wall means into the liquid and configured so as to be contacted by the liquid whenever liquid is in the interior space and is being heated for distillation and to serve as a direct thermal connection from the liquid to a corresponding location outside the wall means, adjacent the location on the inside surface, at which the temperature of the liquid in the pot can be sensed,

wherein the thermal-conduction means extends into the lower portion and lower fluid-passageway means so as to contact and be at the temperature of the liquid passing through the lower fluid-passageway means, and, as the liquid is being heated in the pot, the liquid circulates from the lower portion through the upper fluid-passageway means to the upper portion, and from the upper portion through the lower fluid-passageway means past the thermal-conduction means to the lower portion.

25. (Original) A distillation system, comprising:

a distillation pot, comprising (a) walls, including a heated wall, and a cover that collectively define an interior space in which a liquid is contained as the liquid is being heated in the pot for a distillation purpose, the walls and cover having respective inside surfaces; (b) a plate configured and situated in the interior space so as to divide the space into an upper portion and a lower portion that hydraulically communicate with each other by an upper fluid passageway and a lower fluid passageway defined by the plate; and (c) a thermally conductive member extending from a location on an inside surface of a wall into the liquid and configured so as to be contacted by the liquid whenever the pot contains liquid being heated for distillation and to serve as a direct thermal connection from the liquid to a corresponding location outside the wall, adjacent the location on the inside surface, at which the temperature of the liquid in the pot can be sensed, wherein the thermally conductive member extends into the lower fluid passageway so as to contact and be at the temperature of the liquid passing through the lower fluid passageway, and, as the liquid is being heated in the pot, the liquid circulates from the lower portion through the upper fluid passageway to the upper portion, and from the upper portion through the lower fluid passageway past the thermally conductive member to the lower portion; and

a condensing unit situated relative to the pot so as to receive vapor produced by heating of the liquid in the pot and configured to condense the vapor to a corresponding liquid.

26. (Original) A distillation system, comprising:

a distillation pot, comprising walls, including a heated wall, and a cover that collectively define an interior space in which a liquid is contained as the liquid is being heated in the pot for a distillation purpose, the walls and cover having respective inside surfaces; a reflux plate configured and situated in the interior space so as to have a vertical portion and a sloped portion including a lower end and a higher end, the sloped portion having peripheral edges between the higher and lower ends; and a thermally conductive member extending from a location on an inside surface of a wall into the liquid and configured so as to be contacted by the liquid whenever the pot contains liquid being heated for distillation and to serve as a direct thermal connection from the liquid to a corresponding location outside the wall, adjacent the location on the inside surface, at which the temperature of the liquid in the pot can be sensed, wherein (i) the

peripheral edges of the sloped portion are sealingly attached to respective inside surfaces of the walls so as to divide the interior space into an upper portion and a lower portion that communicate with each other via the higher end and the lower end; (ii) the heated wall is located in the lower portion; (iii) the vertical portion extends upward from the higher end relative to a respective inside surface of a wall so as to define a reflux vent between the vertical portion and the respective inside surface, the reflux vent opening in the interior space beneath the cover to provide said communication from the lower portion to the upper portion; and (iv) the lower end extends, with an intervening clearance, around the thermally conductive member, the clearance being sufficient to provide said communication from the upper portion to the lower portion such that, as the liquid is being heated in the pot, bubbles formed in the liquid in the lower portion are guided by the sloped portion to the reflux vent, rise up the reflux vent, and are propelled from the reflux vent against the inside surface of the cover, thereby releasing entrained liquid for passage through the clearance to below the reflux plate; and

a condensing unit situated relative to the pot so as to receive vapor produced by heating of the liquid in the pot and configured to condense the vapor to a corresponding liquid.

27. (Original) The system of claim 26, further comprising a heater in thermal contact with the heated surface.

28. (Original) The system of claim 26, further comprising a thermostatic switch in thermal contact with the corresponding location outside the wall, the thermostatic switch being operably connected to the heater so as to turn off the heater whenever the liquid in the pot reaches a pre-determined temperature.

29. (Original) The system of claim 26, wherein the inside surface of the heated wall defines at least one vane situated and configured to provide thermal transfer from the heated wall to the liquid in the lower portion.

30. (Currently amended) The system of claim 26, wherein the clearance is situated and configured such that ~~that~~, as the liquid flows through the clearance from the upper portion to

the lower portion, the liquid flows past the thermally conductive member while contacting the thermally conductive member.

31. (Original) The system of claim 26, wherein the thermally conductive member has a fin-like configuration extending toward a center of the pot.

32. (Original) The system of claim 26, having a substantially cylindrical shape as defined by the walls, wherein the heated wall is a bottom wall of the pot, and the inside surface of the heated wall defines at least one vane situated and configured to increase thermal transfer from the heated wall to the liquid in the pot during heating of the liquid in the lower portion.

33. (Original) The system of claim 32, further comprising:

a vapor outlet situated in an upper location on an opposite side of the distillation pot from the reflux vent; and

a conduit hydraulically connecting the vapor outlet to the condensing unit.

34. (Withdrawn) In a distillation method in which a liquid, contained in a distillation pot, is heated in the pot to produce a corresponding vapor that is condensed to form a distillate, a method for heating and controlling the temperature of the liquid in the distillation pot, the method comprising:

heating the liquid in a lower portion of the pot while guiding circulation of the liquid to an upper portion through an upper fluid passageway between the lower and upper portions;

in the upper portion, guiding circulation of the liquid in the upper portion through a lower fluid passageway, between the upper and lower portions, to the lower portion;

during circulation of the liquid through the lower fluid passageway, causing the liquid to flow past a thermally conductive member situated so as to contact the liquid in the lower fluid passageway and in the lower portion;

conducting heat energy from the liquid directly, via the thermally conductive member, to a location outside the pot; and

sensing the temperature of the location outside the pot.

35. (Withdrawn) The method of claim 34, wherein the sensing step is performed using a thermal sensor that produces thermal data concerning the liquid in the lower portion and lower fluid passageway.

36. (Withdrawn) The method of claim 35, further comprising the step of controlling, based on the thermal data, an amount of heat energy applied to the liquid in the pot during the heating step.

37. (Withdrawn) The method of claim 34, further comprising the step of removing foam from the liquid in the upper portion.

38. (Withdrawn) The method of claim 37, wherein the step of removing foam comprises:

guiding bubbles, formed in the liquid in the lower portion, from the lower portion through the upper fluid passageway to impinge on an inside surface of a wall of the upper portion with sufficient force to fracture the bubbles; and

in the upper portion, collecting entrained liquid released from the fractured bubbles; and

circulating the collected entrained liquid from the upper portion through the lower fluid passageway to the lower portion.

39. (Withdrawn) In a distillation method in which a liquid, contained in a distillation pot, is heated in the pot to produce a corresponding vapor that is condensed to form a distillate, a method for heating the liquid in the distillation pot, the method comprising:

heating the liquid in a lower portion of the pot while guiding bubbles, formed in the heated liquid, into an inlet of a reflux vent having an outlet situated above the inlet;

moving the bubbles up the reflux vent so as to cause the bubbles to be expelled from the outlet of the reflux vent onto a surface on which the bubbles fracture to release liquid entrained in the bubbles;

combining the liquid released from the fractured bubbles with liquid in an upper portion of the pot;

replacing the liquid from the lower portion carried, as entrained liquid, up the reflux vent by flowing the liquid from the upper portion to the lower portion through a fluid passage;

in the fluid passage, flowing the liquid by and contacting the liquid to a thermally conductive member extending from a wall of the pot;

conducting heat energy from the liquid directly, via the thermally conductive member, through the wall of the pot to a thermal sensor situated outside the pot; and

based on thermal data produced by the thermal sensor, controlling a distillation parameter of the liquid in the pot during the heating step.

40. (Withdrawn) The method of claim 39, wherein the distillation parameter is an amount of thermal energy applied to the liquid in the pot during the heating step.

41. (Withdrawn) In a process in which a liquid, contained in a vessel defined by vessel walls, is converted in the vessel into a vapor, a method for heating the liquid in the vessel, comprising:

in a lower portion of the vessel, applying heat to a heated wall of the vessel to heat the liquid in the lower portion;

while applying the heat, causing circulation of a fluid stream of the liquid from the lower portion to an upper portion of the vessel to release the vapor and as a fluid stream from the upper portion back to the lower portion;

in the fluid stream from the upper portion to the lower portion, causing the fluid to flow past a thermally conductive member situated so as to contact the liquid in the stream and in the lower portion;

conducting heat energy from the liquid directly, via the thermally conductive member, through the vessel wall to a location outside the vessel; and

sensing the temperature of the thermally conductive member outside the vessel wall.